A NEW COMBINATION IN GRINDELIA (COMPOSITAE-ASTEREAE)

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Xanthocephalum gymnospermoides (Gray) Benth. & Hook. is a stout, annual, fall-blooming species known from central Mexico (Solbrig, 1960) extending into the mountains of Southern Arizona and New Mexico. It is characterized by the brownish-green bark of the stem. The leaves are of variable sizes and are quite glutinous with entire, toothed or slightly serrated margins. Heads, containing a large number of ray and disc florets, are numerous and crowded at the end of the branchlets. The involucre is campanulate and glutinous, while the pappus is variable and may appear as a low crown or as several irregularly shaped awns.

Since its original description (as a *Gutierrezia*) by Asa Gray in 1853, the identity of *Xanthocephalum gymnospermoides* has been a source of confusion and its generic affinity has not been satisfactorily ascertained. This species has been previously referred to as *Gutierrezia gymnospermoides* by Gray in 1853; *Guenthera viscosa* by Regel in 1858; and *Grindeliopsis gymnospermoides* (Gray) Sch. Bip. in 1858.

Asa Gray (1873) emphasized the close similarity between *Xanthocephalum* and *Gutierrezia* and chose to accept Bentham and Hooker's revision of transferring *X. gymnospermoides* to the genus *Gutierrezia.* However, Gray indicated the relationship was still not perfectly clear.

In his documentation of the species, Regel indicated that this species definitely does not belong to the genus *Gutierrezia,* has the character of a *Grindelia,* and also shows relationships with *Heterotheca, Bradburia* and *Dieteria.*

More recently the closeness of *Xanthocephalum gymnospermoides* to *Grindelia* has been expressed by Solbrig (1960), who emphasized the similarities of the involucre, habit and chromosome numbers.

I have noticed during a study of the morphology and anatomy of this genus that *Xanthocephalum gymnospermoides* differs in many respects from other species in the *Xanthocephalum* complex (Ruffin, 1974a) and have questioned the proposed relationships. In addition to certain general characteristics such as the type of

pappus, shape of the involucre, and the resinous character of the involucre and leaves, which suggest an affinity with the genus *Grindelia*, there are several more specific similarities which appear to suggest that *Xanthocephalum gymnospermoides* should indeed be transferred into the genus *Grindelia*.

Koch (1930) described the floral anatomy of *Grindelia squarrosa*. The reduction in the number of vascular strands at the base of the florets and the separation of the bundles at the top of the achene of *G. squarrosa* are representative of the condition noted in *Xanthocephalum gymnospermoides* (Ruffin, 1974a). The highly reduced vasculature in the achene of several other species of *Grindelia* has also been reported by Anderson and Weberg (1974). The supply to the achene divides into two strands. At the top of the ovary the two bundles that have persisted through the ovary wall separate into five bundles which lead into the corolla. Bundle numbers in the ovary of the other species of *Xanthocephalum* were more commonly five, less frequently ten.

The large vessel elements and libriform fibers as well as other xylary feature of *Grindelia decumbens*, *G. squarrosa* and *G. squarrosa* var. *nuda* as described by Anderson and Weberg (1974) reflect similar conditions noted for *Xanthocephalum gymnospermoides* (Ruffin, 1974b). Despite the somewhat larger vessel and libriform fiber elements, the xylary features of *X. gymnospermoides* certainly seem to express a closer affinity with the species of *Grindelia* than with other species of *Xanthocephalum*.

In addition to having features of habit, morphology and anatomy similar to those of *Grindelia*, *Xanthocephalum gymnospermoides* is chromosomally indistinguishable from *Grindelia* with $n = 6$ (DeJong & Longpre, 1963; Raven et al., 1960; Solbrig, 1960; Turner et al., 1962). The cytological condition of all the other *Xanthocephalum* species studied shows a base chromosome number of four.

The features of *Xanthocephalum gymnospermoides* which set it apart from the other species of *Xanthocephalum* appear to be conclusive evidence that *X. gymnospermoides* should be referred to the genus *Grindelia*.

Grindelia gymnospermoides (A. Gray) Ruffin, comb. nov.

Gutierrezia gymnospermoides A. Gray, Plantae Wrightianae **2:** 79. 1853.

Guenthera viscosa Regel, Gartenflora **7:** 44. 1858.

Grindeliopsis gymnospermoides (A. Gray) Sch. Bip. Bonplandia **6:** 356. 1858 (nomen nudum).

Xanthocephalum gymnospermoides (Gray) Benth. & Hook. f. Gen Pl. **2:** 249. 1873.

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